

(3) Lined commercial fire hose that meets Standard 19 of the Underwriters' Laboratories, Inc., (1971 edition) or Federal Specification ZZ-H-451f.

(b) Fire station hydrant connections shall be brass, bronze, or other equivalent metal. Couplings shall either:

(1) Use National Standard fire hose coupling threads for the 1½ inch (38 millimeter) and 2½ inch (64 millimeter) hose sizes, i.e., 9 threads per inch for 1½ inch hose, and 7½ threads per inch for 2½ inch hose; or

(2) Be a uniform design for each hose diameter throughout the vessel.

(c) Each nozzle for a firehose in a fire main system must be a combination solid stream and water spray firehose nozzle that is approve under subpart 162.027. Combination solid stream and water spray nozzles previously approved under subpart 162.027 of this chapter may be retained so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection.

(d) A combination solid stream and water spray firehose nozzle previously approved under subpart 162.027 of this chapter, must have a low-velocity water spray applicator also previously approved under subpart 162.027 of this chapter when installed in—

(1) Machinery spaces containing oil fired boilers, internal combustion machinery or oil fuel units; and

(2) Helicopter decks.

[CGD 73-251, 43 FR 56808, Dec. 4, 1978, as amended by CGD 95-027, 61 FR 26008, May 23, 1996; CGD 95-028, 62 FR 51208, Sept. 30, 1997]

#### **§ 108.427 International shore connection.**

A fire main system on a unit in international service must have—

(a) At least one international shore connection that meets ASTM F 1121 (incorporated by reference, see § 105.01-3).

(b) A cutoff valve and check valve for each connection; and

(c) Facilities available enabling the connection to be used on either side of the unit.

[CGD 73-251, 43 FR 56808, Dec. 4, 1978, as amended by CGD 88-032, 56 FR 35826, July 29, 1991; USCG-2000-7790, 65 FR 58462, Sept. 29, 2000]

#### **§ 108.429 Fire main system protection.**

(a) Each pipe and fire hydrant in a fire main system must be installed to the extent practicable in locations that are not exposed to damage by materials that are moved on or onto the deck.

(b) Each part of the fire main system located on an exposed deck must either be protected against freezing or be fitted with cutout valves and drain valves to shut off and drain the entire exposed system in freezing weather.

#### **AUTOMATIC SPRINKLING SYSTEMS**

#### **§ 108.430 General.**

Automatic Sprinkler Systems shall comply with NFPA 13-1996.

[CGD 95-028, 62 FR 51208, Sept. 30, 1997]

#### **FIXED CARBON DIOXIDE FIRE EXTINGUISHING SYSTEMS**

#### **§ 108.431 Carbon dioxide systems: General.**

(a) Sections 108.431 through 108.457 apply to high pressure carbon dioxide fire extinguishing systems.

(b) Low pressure systems, that is, those in which the carbon dioxide is stored in liquid form at low temperature, must be approved by the Commandant.

(c) Each carbon dioxide system cylinder must be fabricated, tested, and marked in accordance with §§ 147.60 and 147.65 of this chapter.

[CGD 73-251, 43 FR 56808, Dec. 4, 1978, as amended by CGD 84-044, 53 FR 7749, Mar. 10, 1988]

#### **§ 108.433 Quantity of CO<sub>2</sub>: General.**

Each CO<sub>2</sub> system must have enough gas to meet the quantity requirements of § 108.439 for the space requiring the greatest amount of CO<sub>2</sub>.

#### **§ 108.437 Pipe sizes and discharge rates for enclosed ventilation systems for rotating electrical equipment.**

(a) The minimum pipe size for the initial charge must meet table 108.441 and the discharge of the required amount of CO<sub>2</sub> must be completed within 2 minutes.

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(b) The minimum pipe size for the delayed discharge must be at least 1.25 centimeters (1/2 inch) standard pipe.

(c) The pipe used for the initial discharge must not be used for the delayed discharge, except systems having a volume of less than 57 cubic meters (2,000 cubic feet).

§ 108.439 Quantity of CO<sub>2</sub> for protection of spaces.

(a) The number of pounds of CO<sub>2</sub> required to protect a space must be equal to the gross volume of the space divided by the appropriate factor from Table 108.439.

(b) If a machinery space includes a casing, the gross volume of the space may be calculated using the reductions allowed in 46 CFR 95.10-5(e).

(c) If fuel can drain from a space to an adjacent space or if two spaces are not entirely separate, the requirements for both spaces must be used to determine the amount of CO<sub>2</sub> to be provided and the CO<sub>2</sub> system must be arranged to discharge into both spaces simultaneously.

TABLE 108.439—CO<sub>2</sub> Supply Factors  
[Gross volume of space in cubic feet]

Over	Not over	Factor
0 .....	500	15
500 .....	1,600	16
1,600 .....	4,500	18
4,500 .....	50,000	20
50,000 .....	.....	22

§ 108.441 Piping and discharge rates for CO<sub>2</sub> systems.

(a) The size of branch lines to spaces protected by a CO<sub>2</sub> system must meet Table 108.441.

(b) Distribution piping within a space must be proportioned from the supply line to give proper distribution to the outlets without throttling.

(c) The number, type, and location of discharge outlets must distribute the CO<sub>2</sub> uniformly throughout the space.

TABLE 108.441—CO<sub>2</sub> System Pipe Size

CO <sub>2</sub> supply in system, kilograms (pounds)	Minimum pipe size (inches), millimeters (inches)
45 (100) .....	12.7 (1/2).
104 (225) .....	19.05 (3/4).
136 (300) .....	25.4 (1).
272 (600) .....	31.75 (1 1/4).
450 (1,000) .....	38.10 (1 1/2).

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TABLE 108.441—CO<sub>2</sub> System Pipe Size—Continued

CO <sub>2</sub> supply in system, kilograms (pounds)	Minimum pipe size (inches), millimeters (inches)
1,110 (2,450) .....	50.80 (2).
1,130 (2,500) .....	63.5 (2 1/2).
2,023 (4,450) .....	76.2 (3).
3,229 (7,100) .....	88.9 (3 1/2).
4,750 (10,000) .....	101.6 (4).
6,818 (15,000) .....	114.3 (4 1/2).

(d) The total area of all discharge outlets must be more than 35 percent and less than 85 percent of the nominal cylinder outlet area or the area of the supply pipe, whichever is smaller. The nominal cylinder outlet area in square centimeters is determined by multiplying the factor 0.0313 by the number of kilograms of CO<sub>2</sub> required. (The nominal cylinder outlet area in square inches is determined by multiplying the factor 0.0022 by the number of pounds of CO<sub>2</sub> required). The nominal cylinder outlet area must not be less than 71 square millimeters (0.110 square inches).

(e) A CO<sub>2</sub> system must discharge at least 85 percent of the required amount within 2 minutes.

§ 108.443 Controls and valves.

(a) At least one control for operating a CO<sub>2</sub> system must be outside the space or spaces that the system protects and in a location that would be accessible if a fire occurred in any space that the system protects. Control valves must not be located in a protected space unless the CO<sub>2</sub> cylinders are also in the protected space.

(b) A CO<sub>2</sub> system that protects more than one space must have a manifold with a stop valve, the normal position of which is closed, that directs the flow of CO<sub>2</sub> to each protected space.

(c) A CO<sub>2</sub> system that protects only one space must have a stop valve installed between the cylinders and the discharge outlets in the system, except on a system that has a CO<sub>2</sub> supply of 136 kilograms (300 pounds) or less.

(d) At least one of the control stations in a CO<sub>2</sub> system that protects a machinery space must be as near as practicable to one of the main escapes from that space.

(e) All distribution valves and controls must be of an approved type.